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SOME OBSERVATIONS ON THE FIELD BEHAVIOUR OF THE VULNERABLE MYGALOMORPH SPIDER, *IDIOSOMA NIGRUM*

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INTRODUCTION

The Shield-backed Trapdoor Spider *Idiosoma nigrum* (family Idiopidae) is a medium sized mygalomorph spider endemic to the mid-west of Western Australia. The species is distinguishable by its deeply grooved and hardened abdomen (Figure 1) and its twig and leaf litter lined burrow entrance forming a fringe (Figure 2) to assist with prey detection and capture (Main 1952). It is currently listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Schedule 1 (fauna that is rare or likely to become extinct) under the *WA Wildlife Conservation Act 1950* due to a number of threatening processes and its limited geographic distribution (TSSC 2011a).

Despite the high conservation status of the species little is known of its natural history or ecology, particularly its reproductive ecology or conspecific interactions between individuals. During fieldwork for a monitoring project at Weld Range in the Midwest some observations on the behaviour of a male and two females were made which has not been described previously.

The monitoring was part of a larger project aimed at determining the impacts of localised disturbance on the species which involved assessment of selected burrows across the study site to determine population presence and overall condition of the habitat. The assessment process involved measuring individually marked burrow dimensions (lid width,



Figure 1. *Idiosoma nigrum* female showing deeply grooved abdomen.



Figure 2. *Idiosoma nigrum* burrows showing twig and litter lined burrow entrance.

lumen width), assessing general condition of burrow lid and 'twig-lining', presence and position of a specimen (and depth of burrow) and evidence of any recruitment within close proximity to the study burrows.

OBSERVATION

On 8 June 2010 during monitoring activities a male *Idiosoma nigrum* was observed emerging in a defensive stance from a burrow which also contained a female specimen and moved a short distance and entered another burrow which contained another female.

A burrow within the monitoring site was selected for study and its measurements taken and condition assessed. The burrow lid measured 18.44mm and lumen width measured 13.43mm and the overall 'fringe' condition was considered excellent with little or no damage.

The burrow was then probed using a fibre optic scope to obtain visual confirmation of presence of the spider and at what depth. When the fibre optic scope was inserted into the burrow a specimen was confirmed at a depth of approximately 90mm below the entrance. Once disturbed, the spider proceeded to move closer towards the burrow entrance where it remained just below the lid. Generally, specimens would move head down deeper into the burrow and take up a defensive stance by using their shielded

abdomen to block the burrow above them. Within a few seconds the spider had fully emerged and was moving around the burrow entrance taking up an aggressive stance on the burrow lid and surrounds (Figure 3). The spider moved across the 'fringe' and lid a number of times altering its direction towards any movement by observer in a defensive stance covering an area of approximately 100mm around the burrow entrance (Figure 4). The spider was identified as an adult male on the basis of morphological characteristics.

After approximately two minutes outside the burrow the adult male spider moved to the burrow entrance where it remained for a short time below the lid. It then fully emerged from the burrow without disturbance and proceeded to move approximately three to three and a half metres following the shade of surrounding shrubs and trees across leaf litter and soil past other burrows directly to another burrow. It moved around the perimeter of the burrow and fringe and after moving around it, then walked across the fringe where it appeared to delicately touch individual leaves making up the fringe and lid of the burrow before opening the lid and entering.

The burrow the specimen entered had been assessed earlier and contained a large female *Idiosoma nigrum* which was facing down and at a depth of 185mm



Figure 3. *Idiosoma nigrum* male emerging from burrow in defensive stance.



Figure 4. *Idiosoma nigrum* male defending burrow entrance.

blocking the burrow with its abdomen. A few minutes after the male had entered, the burrow was checked again and the male was situated approximately 50 mm below the lid and quickly moved to a depth of approximately 150 mm. The male was unsuccessful at blocking the burrow with its abdomen with visible gaps between it and the burrow sides. The location of the female within the burrow could not be confirmed. The burrow the male emerged from was inspected using the scope again and a large female was present at a depth of 120 mm blocking the entrance with its abdomen.

An additional burrow was encountered during the monitoring where a small individual was attempting to block the burrow passage with its abdomen but was unsuccessful at blocking the entire burrow. While viewing this spider, another specimen could be seen behind it that was successful in blocking the entire width of the burrow.

Weather conditions during the survey were mild with temperatures ranging from low to mid-twenties (°C) daily, dropping to mid-teens during the night. A small amount of rain (approx. 3.5 mm) was recorded falling in the area the day before. Weather conditions remained overcast with cool winds during the observation period.

DISCUSSION

While the reason behind the

behaviour of the male and two females is unknown, it is suspected to be associated with reproductive behaviour. It has been noted that males will leave their burrow in search of females, particularly during wetter months while females spend their entire life in the same burrow (Main 1982; TSSC 2011b). Movement of the male between multiple female burrows suggests they may move on a regular basis in an attempt to mate with multiple females which has been previously suggested for the species (Avon Catchment Council 2007). At signs of disturbance both females excluded the male from moving deeper in the burrow which is likely to increase chances of predation on the male which was unable to securely block the burrow with its abdomen to defend itself. This behaviour may be adopted by females to exclude an undesirable male should mate selection take place.

It is unknown if females allow males to move deeper into the burrow and provide protection during disturbance or if the male is excluded and possibly evicted from the burrow to protect itself from any threats. It is possible that the females may have had already mated. In addition the observation process itself may have had a disruptive influence on the spiders' behaviour. Further field studies are required to observe and determine the reasons for behaviours described in this paper.

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